INTEGRATION MANUAL

VALINA

the next generation

compact, convenient, complete

an atos company

worldline
e-payment services

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Document information

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Contents

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1. About this book

The VALINA is the newest unattended payment terminal from Worldline.

What is in this book

- VALINA and its accessories
- technical specifications
- integrating the VALINA in other equipment such as a vending machine, including safety considerations
- powering and maintaining VALINA
- troubleshooting
- approvals and certifications, including applicable environmental regulations

Who should use this book

- anyone who will be installing a VALINA in a vending machine or other equipment
- field and service technicians using the service unit

Information from this book may be reused in other documentation such as a user guide.

2. VALINA key features

The VALINA is an intelligent all-in-one terminal for unattended payments with and without PIN, supporting a range of standards including EMV and Mifare. It handles payments by chip card, NFC cards and devices, and magstripe card.

The VALINA is PCI 4.x certified, SRED included. It has been designed to provide a complete solution for EMV payments, and can run either newly-developed Android apps or legacy apps (written for the MAPS platform) from Worldline.

Key hardware features include:

- 3.5” touch TFT colour display for an enjoyable payment experience
- small footprint matches EVA/CVS 1.3 standards for Standard Door Module (SDM) dimensions, making integration in vending machines easy

  The VALINA takes up limited space inside the machine: compare this with the footprint of a bank note acceptor (BNA) or coin detector.
- onboard Ethernet, serial interface, MDB, USB host and USB device meet most communications requirements out-of-the-box
- proximity detector (patented) for improved power management

Typical integration scenarios for the VALINA include:

- vending machines, ticket machines and kiosks
- petrol forecourts and car-washes
- on-street and off-street parking
- dispensers and pre-payment meters
- self-service checkouts

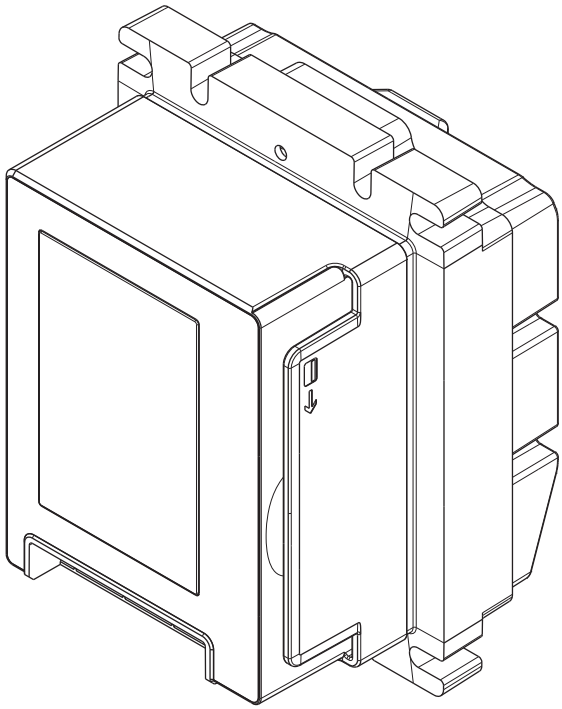


Figure 1. VALINA – front view

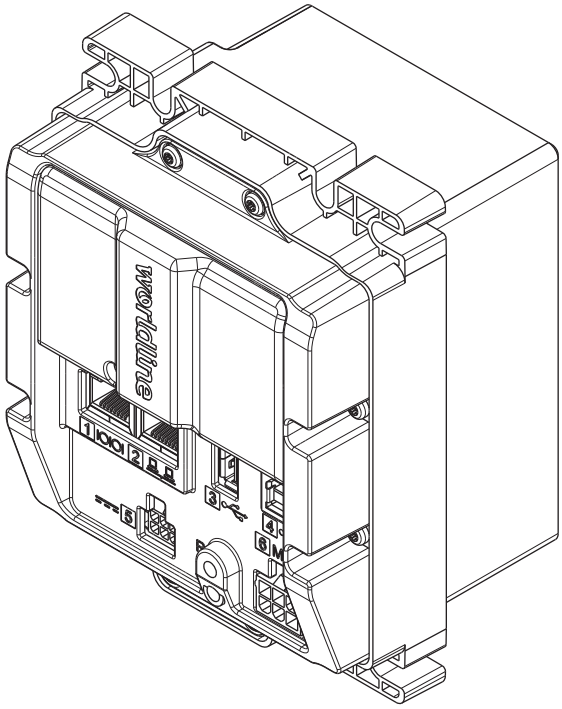


Figure 2. VALINA – back view

For more information on connectors, see Power supply, ports and pin-outs, on page 17.

3. Safety

Follow the guidelines in this manual when integrating the VALINA. Neither Worldline nor its vendor will bear any responsibility or cost for malfunctioning, breakdowns or any anomaly that may result from incorrect handling of the VALINA. Worldline declines any liability if the instructions and precautions contained in this manual are not observed.

If you notice that any VALINA component blocks, does not fit, or shows any other malfunction, contact your vendor. Do not try to repair or alter it in any way.

Use only accessories (power adaptor, cables and so on) provided by your vendor or by an approved source.

Check that the VALINA has completed the required application-loading and key-loading stages.

Operating safety

Keep the VALINA away from excessive heat, fire, high voltage, radiation, shocks and abrasive chemicals.

To guarantee safe operation of the VALINA, make sure:

- the VALINA is firmly fixed in the kiosk/vending machine and correctly powered
- the kiosk/vending machine where the VALINA is mounted is protected from dust, strong sunlight, rain, wind and flying debris (for example, stones thrown up by passing traffic)
- the operating temperature of the VALINA remains between -20°C and 70°C

  This corresponds to an environmental temperature of -20°C to +50°C, depending on the position of the terminal (in direct sunlight, sheltered …)
- the VMC is installed, positioned in line with manufacturer recommendations

Always:

- use only the power adaptor supplied, or a power adaptor compliant with the appropriate specifications
- disconnect the power adaptor before cleaning the housing and for servicing or repair

Never:

- drop, throw, slam or vibrate the VALINA
- let oil, water or other liquids enter the VALINA

- use extension cables to extend the power cable between the power adaptor and the VALINA
- connect any unused cables to the VALINA
- store, install or use the VALINA
  - near any source of excessive voltage fluctuations, electromagnetic fields or microwave radiation (for example, electric motors or high-frequency devices)
  - in a deep-freeze or a defrosting system
- store the VALINA near food, or with explosive substances such as lighter fuel or petrol
- open the VALINA

Repairs and end-of-life

All servicing other than the actions described in this manual must be performed by Worldline or an approved service centre.

Contact your vendor for information on how to dispose of your VALINA at the end of its life. Do not discard, give away or sell your VALINA as it contains materials that can be recycled and must be treated by a professional party.

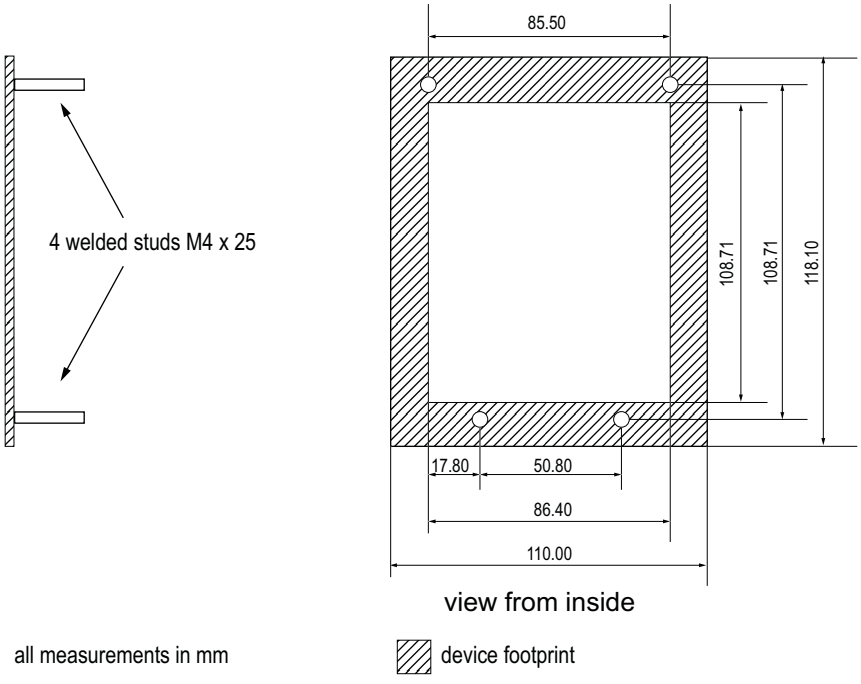
4. Installing VALINA

- read Operating safety, on page 5, before you start installing a VALINA
- make sure the contents of the VALINA package are complete and correct

  Inspect the package for damage, and make sure it contains all the items listed. In case of doubt, or if items are missing or damaged, contact your vendor immediately.

  Make sure that:

  – there is no sign of unusual cables connected anywhere on the VALINA
  – there is no foreign object in either of the card-readers
  – the terminal is not displaying any warning message
  – the housing is not visibly damaged
  – the terminal serial number (on the label) corresponds to the inventory
- make sure the vending machine has the necessary front panel openings and spot-welded connection bolts, and that the weld seams are within permitted limits



- make sure the front panel of the vending machine is smooth and rigid with no unfinished edges on any of the holes or openings.
- installing a SAM card (described on page 12) and installing an optional communications board (described on page 14) are easier before installing the VALINA in a vending machine

- make sure the VALINA cannot be removed from the vending machine after integration

Selecting a location

The terminal is designed for unattended use both indoors and outdoors. Electrical installations where the VALINA is installed must comply with local and regional codes for office and residential electrical wiring, such as International Electrotechnical Commission (IEC).

Finding a proper location is an important aspect of installing VALINA components.

Follow the guidelines given here, and also check local requirements:

- select a location on the machine that is conveniently accessible
- on the front side of the vending machine, make sure that:
  - the VALINA fits in the mounting position
  - the VALINA faces the cardholder and will be clearly visible
  - the display is readable
  - the card slot is accessible
- avoid a position that exposes the VALINA to rain or hostile weather
- make sure air can circulate freely around the components
- to avoid reflections and guarantee readability, do not expose the display to direct sunlight
- for the security of the card-holder, make sure that PIN privacy is guaranteed:
  - locating the display outside the field of vision of cameras, mirrors and so on, and away from stairs
  - check all local regulations and requirements for PIN privacy
- for the convenience of the technician, make sure there is sufficient space on the vending machine to:
  - access the ground connection
  - guide the cables without folding them, and use cable ties
  - fit the mounting brace that fastens the terminal tightly into the machine
  - access the rear side of the VALINA
- the maximum permitted length of the cable between the VALINA and the vending machine controller (VMC) is 3m

Packaging

packaging

quantity	item
1	VALINA terminal
2	fixing plates
1	gasket
optional items	
1	power adaptor
cable(s)	RS232 VALINA serial cable 2m (ePOS/ECR to VALINA), Ethernet, RS232, USB, power (TTL)

Inspect the package for damage, and make sure it contains all the items listed. In case of doubt, or if items are missing or damaged, contact your shipping company and/or vendor.

If you are going to attach the mounting plate direct to the vending machine, you will also need four M4 locknuts. These are not included in the package.

Installation step by step

Step 1. Check the gasket positioning

Lugs (pins) in the rubber should fit into the terminal openings above and below.

Step 2. Mount the VALINA in the vending machine

1. Line up the VALINA with the front panel opening on the vending machine.

valinaAlign

Figure 3. Aligning VALINA terminal and mounting plate

2. Clamp the EVA frame to the rigid front plate of the machine using four locknuts.

   note: these locknuts are not included in the terminal package

3. Tighten the locknuts in a Z-pattern.

   To avoid damaging the VALINA, do not over-tighten the nuts. 0.7Nm is recommended, depending on the material the front plate is made from.

After mounting the VALINA on the vending machine, continue by connecting the power and communications cables as described under Power up VALINA and fasten cables, on page 10

Step 3. Connect power and communication cables at the back of the VALINA

There are six numbered interfaces on the back of the VALINA, for connections to external peripherals.

For detailed information on pinouts, see Power supply, ports and pin-outs, on page 17.

table

Step 4. Power up VALINA and fasten cables

The VALINA requires an external power supply, using one of these two options:

- connector 5 – 12V DC 2A (Microfit connector)
- connector 6 – 24-48VDC (MDB connector)

The VALINA cannot be powered through any other port.

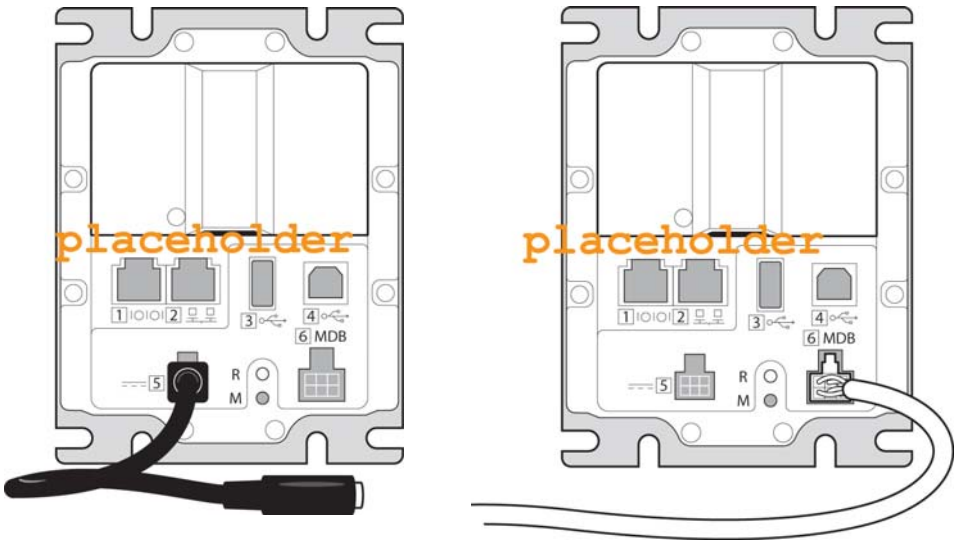


Figure 4. Power connections – Microfit (left), MDB (right)

To reduce wear on the connectors, use a cable tie to fasten the cables to the strain-relief point on the EVA frame of the VALINA.

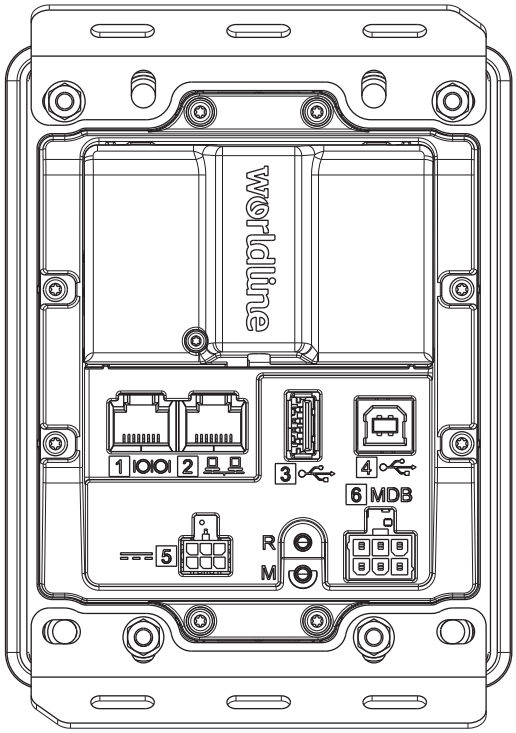


Figure 5. Cable ties for VALINA

In normal state, the status LED on the front of the VALINA lights up steadily as soon as you power up the terminal. In tampered state, the device displays a warning message and it is not possible to use the terminal to make a payment. When a warning message is displayed:

1. remove the terminal from service
2. contact the supplier immediately, who may then report the problem to Worldline
3. keep the terminal available for possible forensic investigation

Step 5. Install SAM card – optional

The VALINA has two type ID 0 SAM slots.

- install any SAM card before installing the optional communications board
- install both SAM card and communications board before installing the VALINA in the vending machine.

1. open TELECOM cover

   Remove the retaining screw of the TELECOM cover (if present) and open the cover.

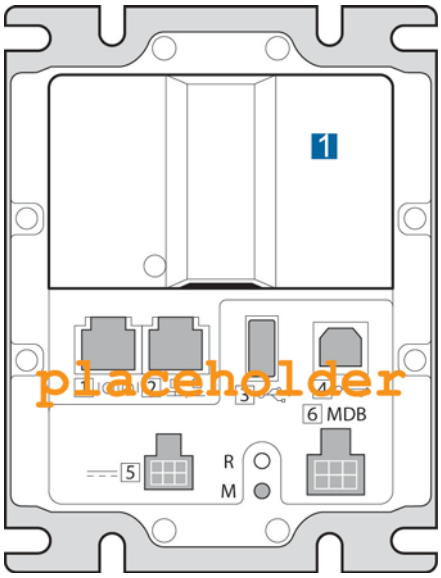


Figure 6. VALINA with TELECOM cover [1] in place

2. open SAM holder and insert SAM card

   Open the SAM holder (with the two bar-code labels on) and insert one or two SAM cards as shown. Make sure the card is completely inserted.

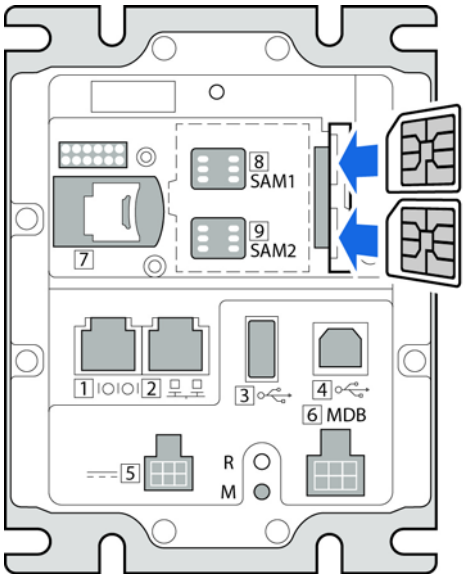


Figure 7. Fitting SAM cards

3. close all slots

   Close the SAM holder, and press it down until it engages with an audible click

4. close the TELECOM cover

If you will be installing the optional micro SD card or the optional communications board, do not close the TELECOM cover yet

If you are using a retaining screw for the cover, use one 8 torx screw (included). Do not over-tighten the screw.

Step 6. Install micro SD card – optional

1. open TELECOM cover

   Remove the retaining screw of the TELECOM cover (if present) and open the cover.

2. insert the microSD card in the holder as shown

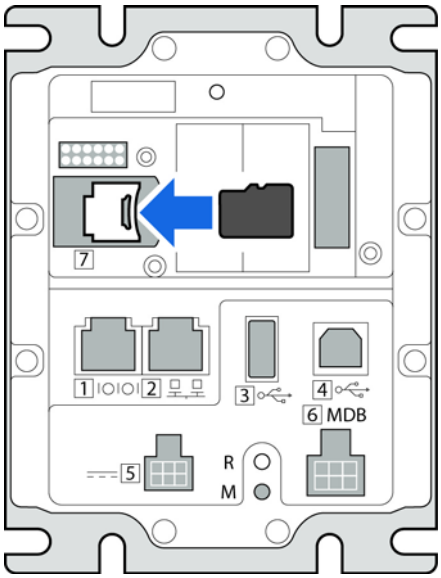


Figure 8. Inserting the micro SD card

If you will be installing the optional communications board, do not close the TELECOM cover yet

If you are using a retaining screw for the cover, use one 8 torx screw (included). Do not over-tighten the screw

Step 7. Install communications board – optional

When the VALINA is going to use via 2G/3G or WiFi/Bluetooth, a communications board is required. YONEO communications boards are compatible with the VALINA.

For easy access to the communications board, install the board in the VALINA before installing the VALINA in the vending machine.

1. Prepare the communications board.
   - unpack the communications board, taking precautions to avoid electrostatic discharge (ESD)
   - make sure that all the required accessories (board, cables, and so on) are correct and present
   - insert SIM under clip
2. Open TELECOM cover if necessary

   Remove the holding screw of the TELECOM cover (if present) and open the cover.
3. Fit the communications board:
   a. carefully align the connector of the communication board with the connector on the VALINA, taking care not to damage the connector.
   b. slide the communication board under the retention clip on the left side (viewed from the back)

c. make sure that the connectors are still aligned correctly

d. gently press the board down into the holding clip, until it engages with an audible click

valinaComms

Figure 9. Inserting optional communications board in VALINA

4. Connect antenna cable

   Connect the antenna cable to the connector on the board. Make sure it is an antenna with a card connector and a resistance of 50 Ohm.

   Do not plug in cables before installing the communication board in the VALINA

5. Fit the SIM in the SIM card holder

   The SIM card is required for 2G/3G.

valinaSIM

Figure 10. Fitting the SIM card

   Insert the SIM card as shown. Make sure the card is completely inserted, then close the SIM card holder.

6. Guide the cable or antenna and close the TELECOM cover

   Guide the cable or antenna through the notch in the back housing, then close the TELECOM cover while holding the cable or antenna cable in place. If you are using a retaining screw for the cover, use one 8 torx screw (included). Do not over-tighten the screw.

5. Power supply, ports and pin-outs

This chapter describes the power supply / data connectors on the VALINA.

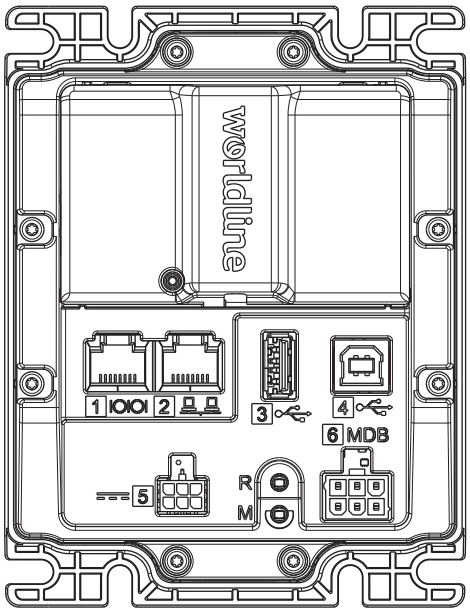


Figure 11. Power supply / data connectors on the VALINA

Power supply

The VALINA is powered from an external power adaptor through port 5 (TTL) or port 6 (MDB).

- the TTL interface is a surface-mounted, dual-row, 6 circuit connector (Molex Microfit connector) with a press-fit metal retention clip

Table 1 Pinout for Microfit 43045-0616 interface

pin	description	pin	description
1	Vcc in	4	IN [1]
2	GND	5	IN [2]
3	IN [0]	6	OUT [0]

- the MDB interface is …

Table 2 Pinout for MDB interface

pin	description	pin	description
1		4	
2		5	

Table 2 Pinout for MDB interface			
3		6	

The VALINA is CE certified in combination with the Powertech ADS 0271-B adaptor. If any other power supply is used, the distributor is responsible for compliance with local safety requirements and regulations.

USB-B (device) interface

The VALINA is fitted with a USB 2.0 Full Speed (up to 480 MBit/sec) device interface, which can be used to connect to ePOS equipment or a PC and to perform keyloading.

The necessary USB-driver is included in recent installation packages of most operating systems (Windows, MacOS and Linux). If the driver is not available, contact your vendor.

VALINA cannot be powered through the USB device interface: it always needs an external power supply.

Table 3 Pinout for USB-B interface		
pin	**description**	**direction**
1	VCC (5V) VALINA	IN
2	D- VALINA	IN/OUT
3	D+ VALINA	IN/OUT
4	GND	

Ethernet 10/100 Mbit

The VALINA has a standard 10/100 megabit Ethernet interface, using an RJ45 (8p/8c) connector.

VALINA cannot be powered through the Ethernet interface.

Table 4 Pinout for Ethernet 10 Mbit connector				
pin	**description**	**direction**		
8	HF	GND		
7	HF	GND		
6	RX B	VALINA	[IN]	from network
5	HF	GND		
4	HF	GND		
3	RX A	VALINA	[IN]	network
2	TX B	VALINA	[OUT]	network
1	TX A	VALINA	[OUT]	network

RS-232 interface

The VALINA has one RS-232 interface with RTS/CTS flow-control, for connecting to peripherals such as a vending-machine controller, ePOS equipment or a printer.

VALINA cannot be powered through the RS-232 interface.

The interface allows connections up to 230,400bps and is fitted with an 8p RJ45 connector with the following pinout.

Table 5 Pinout for RS-232 interface

pin	description	direction	
8	VCC	VALINA	[IN]
7	VCC	VALINA	[IN]
6	TX	VALINA	[OUT]
5	RX	VALINA	[IN]
4	CTS	VALINA	[IN]
3	RTS	VALINA	[OUT]
2	GND		
1	GND		

USB-A (host) interface

The VALINA is fitted with a USB 2.0 full speed (up to 480 MBit/sec) host interface, which can be used to connect to a USB stick or other storage device.

VALINA cannot be powered through the USB host interface: it always needs an external power supply.

The pin-out of the USB host interface is as follows:

Table 6 Pinout for USB host interface

pin	description	direction
1	VCC (5V) VALINA	OUT
2	D- VALINA	IN/OUT
3	D+ VALINA	IN/OUT
4	GND	

Vending machine controller

The VALINA communicates with the Vending Machine Controller (VMC) through RJ45 connector 3 (RS-232) or through TTL connector 6.

Power consumption

The VALINA is fitted with a proximity sensor that helps supports smart energy consumption by switching between different states.

Table 7 power consumption

state	**details**
transaction	terminal processing transaction by GPRS (backlight on)
transaction	terminal processing transaction by Ethernet (backlight on)
stand-by	wake-up triggered by proximity detector wake-up time ≤ 1 second
sleep	wake-up triggered through TTL port wake-up time ≤ 1 minute

6. JTAG/DEBUG port

For development and repair purposes, the VALINA is equipped with a JTAG/Debug port, underneath the SAM cover. This port can be used to connect a PACIFIC Debug Interface for debugging and logging purposes. This port can also be used to connect a JTAG Interface for repair and reflash purposes. The following interfaces are available on this port:

The JTAG/Debug port uses a spring-loaded connector with 2.54 mm pins. It is available on all terminals (normal, production, and development).

The following interfaces are available on this port:

- JTAG-interface towards the ASIC
- 3.3V UART interface towards Core 1 (secured – UART_A3)
- 3.3V UART interface towards Core 2 (unsecured – UART_B3)

jtagDebug

Figure 12. JTAG/DEBUG port

Table 8 Pinout for JTAG/Debug port – all terminals

pin	description	direction	pin	description	direction
1	GND		2	JTAG TCK	IN
3	JTAG TDI	IN	4	JTAG TDO	OUT
5	JTAG TMS	IN	6	JTAG TRST	IN
7	JTAG TSEL(1)	IN	8	3V3	
9	DEBUG RXD_B	IN	10	DEBUG TXD_B	OUT
11	DEBUG RXD_A	IN	12	DEBUG TXD_A	OUT

Table 9 Pinout for JTAG/DEBUG port – development terminals only

pin	description	direction	pin	description	direction
1	3V3		2	JTAG_TSEL(0)	
3	JTAG TRST	IN	4	GND	
5	JTAG TDI	IN	6	GND	IN
7	JTAG TMS	OUT	8	GND	IN
9	JTAG TCK	IN	10	GND	IN
11	JTAG TDO	OUT	12	GND	IN

Table 9 Pinout for JTAG/DEBUG port – development terminals only

pin	description	direction	pin	description	direction
13	3V3		14	JTAG AUTOWR	IN
15	JTAG TSEL(1)	IN	16	JTAG SRSTn	IN/OUT
17	DEBUG RXD_B	IN	18	DEBUG TXD_B	OUT
19	DEBUG RXD_A	IN	20	DEBUG TXD_A	OUT

7. Cleaning

For optimal functioning of your Worldline terminal and accessories, clean them regularly.

1. Disconnect the equipment from the power supply.
2. Clean the equipment with a soft damp cleaning cloth.
3. Clean the display with a soft dry anti-static cleaning cloth.
4. Clean card readers every two weeks, with an appropriate cleaning card.

   Contact your vendor for information about cleaning cards.

After cleaning, do not forget to re-connect the equipment.

Do not:

- immerse the products in water, or use a lot of water while cleaning
- spray water directly on to countertop or portable terminals
- let dirt enter the card readers
- use detergents, solvents, alcohol or abrasive products

These products may damage surfaces and make transparent parts opaque.5.

Cleaning cards

valinaCleanChip

Figure 13. Cleaning card for chip-card reader (sliding brush)

Follow the instruction found on the packaging of the cleaning card. This card can be used for up to 12 cleanings of the reader before you need to replace it.

valinaCleanMag

Figure 14. Cleaning card for magstripe-card reader

Follow the instructions on the packaging of the cleaning card. This card can be used for up to 8 cleanings of the reader before you need to replace it.

8. Repairs and end-of-life

All servicing other than the actions described in this manual must be performed by Worldline or an approved service centre.

When a VALINA or any of its accessories is at the end of its life, it must not be simply thrown away, given away or sold on. As terminal vendor, you are responsible for the correct decommissioning of terminals and their components or accessories at their end of life. Remember that:

- security awareness requires erasing cryptographic components securely and completely
- sustainability requires recycling as many components as possible
- environmental awareness requires disposing of hazardous materials professionally

Step by step

Inspect the terminal for completeness, signs of intrusion and tampering, as explained under Security recommendations, on page 17.

If you find any evidence of tampering, report the problem to Worldline and keep the terminal available for possible forensic investigation

1. If you do not find any evidence of tampering, dispose of the terminal following local rules and regulations for disposal of electronic equipment, such as WEEE. Make sure that the person or organisation responsible effectively destroys the terminal and its components.
2. Log the physical disposal of the terminal in the assets register.

Appendix A. Technical specifications

display

3.5”, 320 x 480 pixels, 64K colour, capacitative touchscreen (backlit)

communications – on-board

Ethernet 10/100

RS-232

communications – optional extensions

2G/3G – GSM, GPRS, EDGE / UMTS, HSDPA

Bluetooth/WiFi

interfaces

Ethernet

RS232, to serial peripherals (for example, vending machine controller or printer)

Microfit 43045, power input/output socket (12V DC, 2A)

MDB

USB host and USB device

chip security modules

2 SAM slots type ID 0

2G/3G interface board contains 1 SIM slot

processing capabilities

hardware cryptographic accelerators

memory

512 Mbytes RAM

4 Gbytes Flash memory

micro USD

power supply

12V DC, 2A (when using Microfit)

24 – 45 VDC (when using MDB)

proximity detector

weight

573 g

Dimensions

For exact measurements, including tolerances, download drawing 3034910003 from the Partner Extranet.

integration dimensions (excluding gasket)

mounting aperture: 110 * 146 (height/width)
clearance: min. 88 (depth)

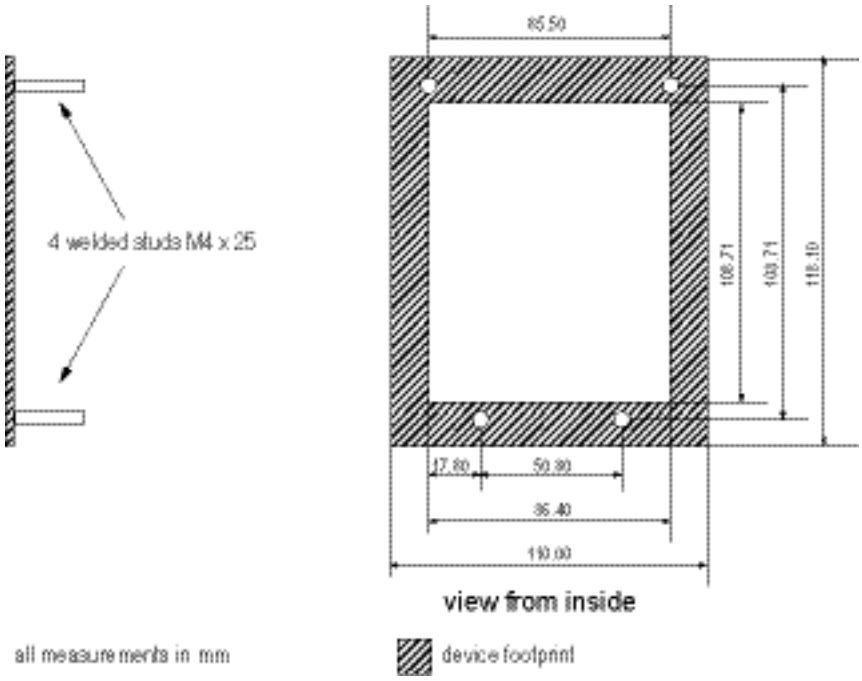


Figure 15. Internal mounting details for VALINA

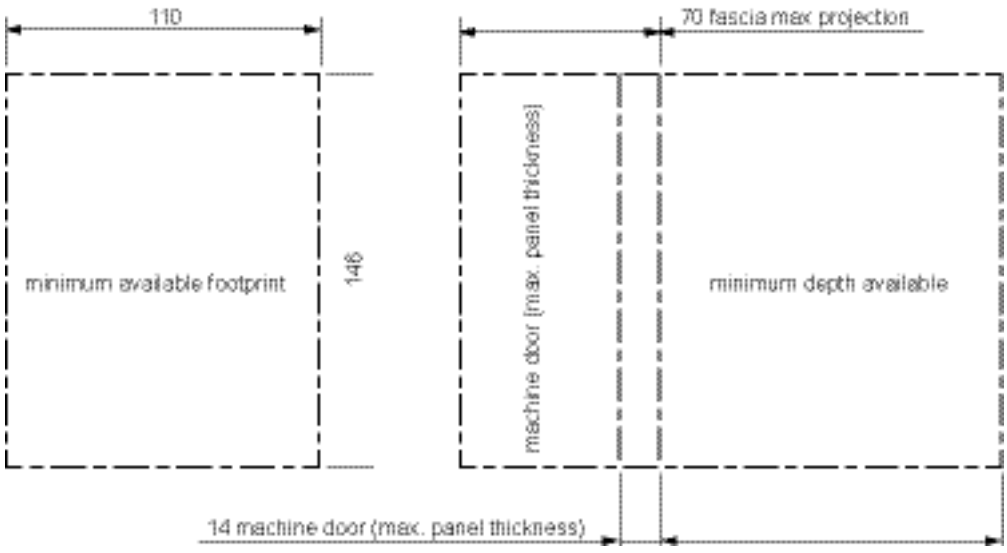


Figure 16. Minimum required space (from EVA Specs)

Optional accessories

- communications boards
- debug interface
- power adaptor
  input100-240 VAC, 50 – 60 Hz; output 12 VDC 2A

Environmental conditions

operating temperature/humidity

-20°C to +70°C (for VALINA without display); 0% to 90% RH non-condensing

storage temperature/humidity

-25°C to +70°C; storage humidity: 0% to 95% RH

flammability rating

ANSI/UL 94 V-0

dust-/waterproof rating

IP65

protection classification

vandal-proof class IK08

Software

- Android and Linux® OS
- Linux-based development kit (C and Java™)
- secured remote download of software (RTL server)

Appendix B. Approvals

Worldline declares that the VALINA complies with Radio and Telecommunications Terminal Equipment directive 1999/5/EC, based on test results referencing harmonised standards. The declaration of conformity (DoC) can be consulted on the partner extranet or on the terminal website:

- terminals.worldline.com, under Technology and Innovation
- internationalpartners.extranet.worldline.com

The product is designed for operation in commercial or residential structures that have electrical installations in compliance with local and regional codes for office and residential electrical wiring, such as International Electrotechnical Commission (IEC) 364 parts 1 through 7.

The VALINA has been approved/certified in line with international standards including:

Approvals/certification

- PCI PTS 4.x (SRED and Open Protocols)
- MasterCard TQM
- EMVCo Level 1 contact V4.3
- EMVCo Contactless V2.5
- CE directives 1995/5/CE, 2004/108/CE, 2006/95/CE
- Environmental directives Reach, RoHS 2, WEEE
- FCC

EMC emissions and immunity

- EN61000-3 Electromagnetic compatibility (EMC) – Part 3, Testing and measurement techniques, Section 2, Limits for harmonic current emissions (equipment input current 16A per phase)
- EN61000-4 Electromagnetic compatibility – Part 4: Testing and measurement techniques:
  - Section 3, Electromagnetic compatibility – conducted disturbances induced by radio-frequency field: Immunity test
  - Section 5, Surge immunity
  - Section 6, Immunity to conducted disturbances induced by radio-frequency fields
  - Section 8, Power frequency magnetic field: Immunity test
- EN55022 Limits and methods of measurement of radio disturbance characteristics of IT Equipment

ESD immunity

- EN61000-3 Electromagnetic compatibility – Part 3: Testing and measurement techniques, Section 3: Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rate current 16A per phase
- EN61000-4 Electromagnetic compatibility – Part 4: Testing and measurement techniques:
  - Section 2: Electrostatic discharge immunity test Voltage fluctuations and transient
  - Section 4: Electrical fast transient / burst immunity test
  - Section 11: Voltage dips, short interruptions and voltage variations immunity test

Safety

EN60950-1 Information technology equipment

VALINA with GSM

- EN301 489 Electromagnetic compatibility and radio spectrum matters (ERM); Electromagnetic compatibility (EMC) standard for radio equipment and services
  - Part 1: Common technical requirements
  - Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)
- EN301 511 Global system for mobile communications (GSM); Harmonised EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements of article 3.2 of the R&TTE directive (1999/5/EC)

VALINA with WLAN

- EN301 489
  - Part 1: Common technical requirements
  - Part 17: Specific conditions for 2.4 GHz wideband transmission systems and 5 GHz high performance WLAN equipment
- EN300 328 Electromagnetic compatibility and radio spectrum matters (ERM) Wideband transmission systems